RESEARCH HIGHLIGHTS

Selections from the scientific literature

PALAEONTOLOGY

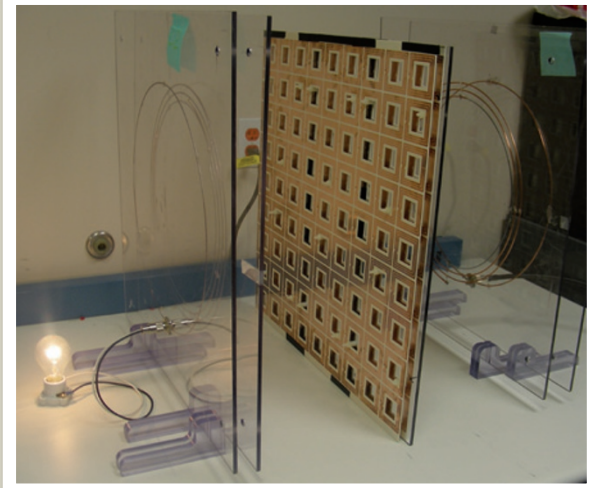
Worldly dinosaurs roamed afar

A fossil unearthed in Australia suggests that dinosaurs roaming Earth's single supercontinent before it fragmented occupied a much larger geographical range than previously thought.

Paul Barrett at the Natural History Museum in London and his colleagues analysed a fossilized vertebra found in southern Australia. It dates back to the Early Cretaceous period between about 145 million and 100 million years ago — the time during which the supercontinent Pangaea was splitting up. The bone is from a spinosaurid theropod, a carnivorous bipedal dinosaur. The specimen is surprisingly similar to spinosaurids from Pangaea's northern region, Laurasia.

This finding, along with other recent fossil discoveries in the Southern Hemisphere of dinosaurs that were thought to have lived only in the north, suggests that dinosaurs had a near-global distribution before the continental separation.

Biol. Lett. **doi:10.1098/rsbl.2011.0466 (2011)**



B. WANG/MITSUBISHI ELECTRIC RESEARCH LABS

TECHNOLOGY

A jump on wireless power

Wireless power transfer for consumer electronics has been hamstrung by modest efficiencies and transfer distances of just a couple of metres. But metamaterials — engineered materials with unique properties — can boost the transfer, say Bingnan Wang at the Mitsubishi Electric Research Laboratories in Cambridge, Massachusetts, and his colleagues.

The researchers positioned a metamaterial slab — a grid of square-shaped copper spirals — midway between transmitting and receiving antennae. The antennae form part of a power-transmission system designed to send 80 watts towards a 40-watt light bulb half a metre away (**pictured**). The metamaterial amplifies the electromagnetic waves, enhancing power transmission.

With the slab, the transfer efficiency was 47% and the bulb shone brightly. Without the slab, efficiency dropped to 17% and the bulb barely glowed.

Appl. Phys. Lett. 98, **254101 (2011)**

CLIMATE CHANGE

Storms shift with climate change

Standard climate models predicting that storm tracks in the Northern Hemisphere will move poleward as greenhouse-gas levels increase may not be telling the whole story. Refined simulations that resolve circulation changes in the middle atmosphere suggest that, in some regions, storms may move in the opposite direction.

Adam Scaife at the UK Met Office Hadley Centre in Exeter and his colleagues compared the response of storms to changing greenhouse-gas levels in two standard climate models and in extended versions that include stratospheric changes.

The extended models project a shift of winter storm tracks in the Atlantic storm regions towards the Equator, accompanied by increased extreme winter rainfall over Western and Central Europe. Increased storminess and rainfall at mid-latitudes may substantially raise the risk of future flooding, the authors note.

Clim. Dyn. **doi:10.1007/s00382-011-1080-7 (2011)**

BIOLOGY

Algal synchronized swimming

Suspensions of swimming algal cells form intricate mottled patterns that are governed by a complex interplay between light, gravity and fluid dynamics. The patterns (**pictured**) change with shifting lighting conditions, which could one day be exploited to improve the yields of bioreactors that use algae to produce biofuel.

M. A. BEES

Rosie Williams and Martin Alan Bees of the University of Glasgow, UK, studied the patterns formed by suspensions of *Chlamydomonas augustae* cells in response to changes in the orientation and intensity of the light source. As overhead white light grew brighter, dense groups of cells first moved apart, then drew closer together. When the algae were lit from below, brighter light resulted in a shortening and then a levelling off of distances between dense cell groups.

Such pattern changes could be exploited to increase the penetration of light and nutrients to cell suspensions, and to concentrate cells for harvesting.

J. Exp. Biol. 24, **2398–2408 (2011)**

MOLECULAR NEUROSCIENCE

Can humans sense magnetic fields?

Animals make proteins called cryptochromes that, in creatures such as migratory birds, are thought to enable sensing of Earth's magnetic field for navigation. Now researchers show that human cryptochrome may be sensitive to magnetic fields.

Steven Reppert at the University of Massachusetts Medical School in Worcester and his colleagues replaced